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OFF-SITE RADIOLOGICAL SURVEILLANCE
NIMBUS B-2/SNAP-19 LAUNCH
APRIL 13, 1969

by
Environmental Surveillance
Western Environmental Research Laboratory

ENVIRONMENTAL PROTECTION AGENCY

Published December 1971

This surveillance performed under a Memorandum of
Understanding (No. SF 54 373)
for the Albuquerque Office
U. S. ATOMIC ENERGY COMMISSION

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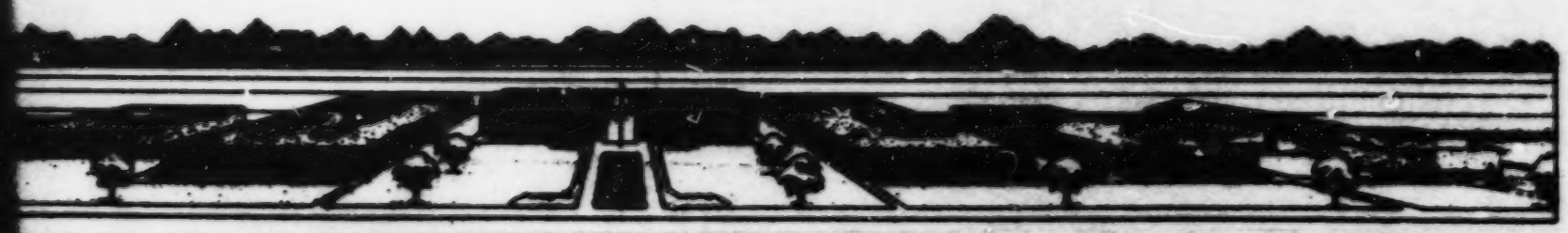

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*Formerly part of the Southwestern Radiological Health Laboratory,
U. S. Department of Health, Education, and Welfare, Public Health Service,
Environmental Health Service, Environmental Control Administration,
Bureau of Radiological Health.

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ABSTRACT

The Western Environmental Research Laboratory provided off-site surveillance for the successful launch of the Nimbus B-2/SNAP-19 weather spacecraft on April 13, 1969.

Environmental monitoring and samples taken before and after the launch indicated no release of radioactivity.

I. INTRODUCTION

The Western Environmental Research Laboratory (WERL) of the Environmental Protection Agency (EPA) provided off-site monitoring for the launch of the Nimbus B-2/SNAP-19 weather spacecraft. This report presents the results of that surveillance in accordance with general responsibilities for radiation surveillance and in compliance with the Atomic Energy Commission, Nevada Operations Office (AEC/NVOO), request by letter of February 7, 1969, (AEC/NVOO to the Director, SWRHL).

Two SNAP-19 packages were incorporated in the power supply of the Nimbus B-2 weather spacecraft. The SNAP-19 package is a radioactive thermoelectric generator powered by ^{238}Pu. The weather spacecraft was launched aboard a Thorad/Agena-D rocket from location SLC-2 East (Figure 1), Vandenberg Air Force Base at 2355 PST, April 13, 1969.

The launch took place with no apparent anomalies. Environmental samples were collected before and after the launch to verify that no radioactivity was released.

II. SAMPLE COLLECTION AND ANALYSIS

Samples collected included air, vegetation, milk, soil, and water (fresh and salt). Sampling locations were set up to coincide with previous work done in the area[1, 2].

Fifty-one samples were collected and analyzed.

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[1] Radiation Surveillance in Santa Barbara County, California, July 1, 1963 - January 1, 1969; the EDP of SWRHL, Department of Health, Education, and Welfare, PHS, Las Vegas, Nevada, March 15, 1969.

[2] Nimbus B/SNAP-19 Launch, May 15, 1968, Off-Site Radiological Surveillance, by Environmental Surveillance, Southwestern Radiological Health Laboratory, DHEW, PHS, NCRR, December 1968, SWRHL-80r.

III. DESCRIPTION AND INTERPRETATION OF DATA

The monitoring data and sample results are presented in Tables 1,2 and 3.

The ground monitoring summary, Table 1, includes average instrument readings before and after the launch. The alpha activity on the ground (cpm/59 cm^2) is listed under the PAC-1S column. The gamma activity (cpm), as measured with a Plutonium Gamma Probe, is listed under the PG-1 column. Although there is a relatively large difference between the stations, this is a characteristic of the survey meter used and the variation in natural radioactivity and is not an indication of activity levels above background. The levels are comparable to those reported in similar studies[2] and were as expected for natural radioactivity.

The gross alpha summary, Table 2, includes results on soil, water, and vegetation with results expressed as activity (pCi) per gram or liter. The data are about as expected when compared to previous work[2].

The air sample gross alpha activity summary is presented in Table 3. In all cases, the alpha activity was less than eight counts per minute total for all volumes greater than or equal to 250 cubic meters. Beta and gamma analyses were done on all filters. No evidence of radioactivity from this operation was found.

During this period, the WERL operated an air surveillance network consisting of 105 sampling stations in 20 states west of the Mississippi River. From April 13 to April 27, all filters were carefully examined for gross alpha activity. No evidence of an increase in gross alpha activity was found.

A milk sample collected in Santa Maria on April 12 contained no detectable levels of radionuclides other than naturally occurring ^{40}K. Typical detection limits are 10 pCi/l for ^{131}I, 20 pCi/l for ^{137}Cs, and 2 pCi/l for ^{90}Sr.

Milk samples were not collected after the successful launch because additional background samples were not required.

IV. SUMMARY

The WERL monitored the off-site area before and after the successful launch of the Nimbus B-2/SNAP-19 weather satellite. Fifty-one environmental samples were collected and analyzed. All results indicated no increase in environmental radioactivity levels and these levels were comparable to studies previously conducted in this area.

TABLE 1

Ground Monitoring Summary

LOCATION	DATE	PAC-1S [a] α(cpm/59 cm^2)	PG-1 γ(cpm)	E-500B [b] (Open Probe) mR/hr
Surf	4-9-69	50	2500	0.03
	4-14-69	50	2500	0.03
Miguelito Park	4-9-69	7	6000	---[c]
	4-14-69	8	6000	---
Paradise Store	4-10-69	3[d]	2000[d]	0.03
	4-14-69	8	5000	---
Gaviota State Park	4-10-69	25	2000	---
	4-14-69	25	1700	---
Jalama Beach	4-10-69	15[d]	800	---
	4-14-69	8	800	---
Santa Maria	4-11-69	5	2000	---
	4-14-69	5	2000	---

[a] The average of five readings within one square meter.
[b] The reading is with a Geiger-Mueller probe with the shield open. The closed shield probe was calibrated with ^{137}Cs. The unit mR/hr indicates a meter deflection and not exposure rate.
[c] Not taken.
[d] Variation in background readings due to taking readings at different locations.

TABLE 2

Gross Alpha Summary

LOCATION	DATE COLLECTED APRIL 1969	SOIL (pCi/gm)	WATER (pCi/l)		VEGETATION (pCi/gm)
			FRESH	SALT	
Gaviota State Beach	9	28		Lt(4)*	Lt(4)
	14	20		Lt(4)	Lt(4)
Lake Cachuma Park	11	5	Lt(2)		-----
	14	---	Lt(2)		Lt(4)
Miguelito Park	11	6	Lt(2)		Lt(4)
	14	4	Lt(2)		Lt(4)
Jalama Beach	12	Lt(4)		Lt(4)	Lt(4)
	14	Lt(4)		Lt(4)	Lt(4)
Ocean Park	9	Lt(4)		----	-----
	14	5		Lt(4)	Lt(4)
Santa Maria	10	Lt(4)	Lt(2)		Lt(4)
	14	Lt(4)		----	Lt(4)
	14	Lt(4)		----	Lt(4)

*Lt(x) - Denotes results less than (x).

---- Denotes samples not taken.

TABLE 3

Air Sampling Summary

LOCATION	TIME ON		TIME OFF		ALPHA ACTIVITY
Ocean Park	4-9	1055	4-10	0930	ND*
	4-10	0935	4-11	1015	ND
	4-11	1040	4-12	1015	ND
Lake Cachuma Park	4-8	1130	4-9	1605	ND
	4-9	1618	4-10	1628	ND
	4-10	1640	4-11	1710	ND
Miguelito Park	4-9	1100	4-10	0905	ND
	4-10	0930	4-11	0945	ND
Santa Maria	4-9	1330	4-10	1030	ND
	4-10	1100	4-11	1150	ND
	4-11	1200	4-12	1200	ND
Jalama Beach	4-9	1150	4-10	0930	ND
	4-10	1640	4-11	1029	ND
	4-11	1035	4-12	1150	ND
	4-13	1735	4-14	0857	ND
Gaviota State Beach	4-9	1120	4-10	0920	ND
	4-10	0935	4-11	1015	ND
	4-11	1045	4-12	1330	ND
	4-13	2345	4-14	0920	ND

*ND - less than 8 cpm total alpha activity when counted 8 days after collection, volumes $\geqq$ 250 m^3.

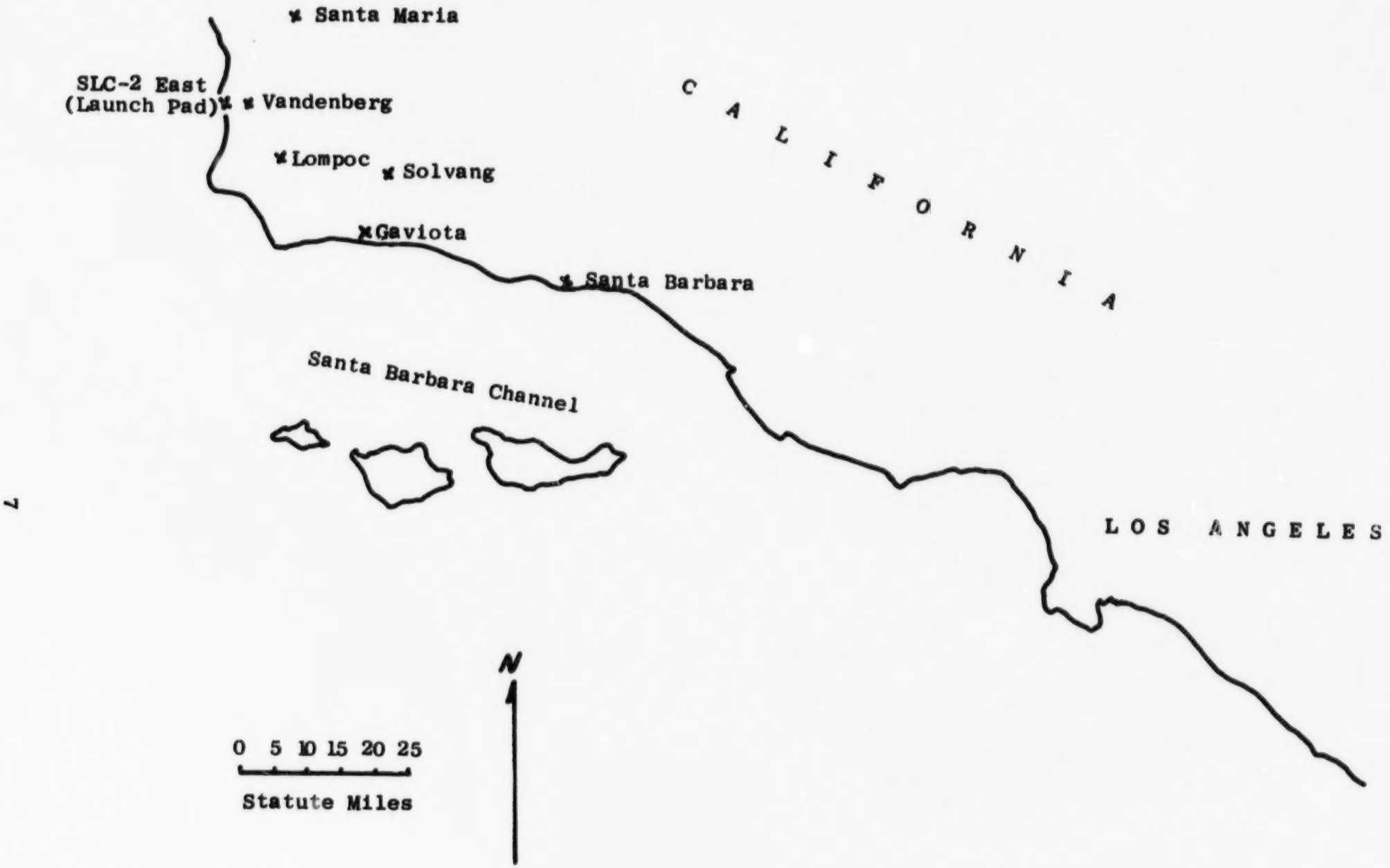

FIGURE 1

Nimbus-B2/SNAP-19 Surveillance Area